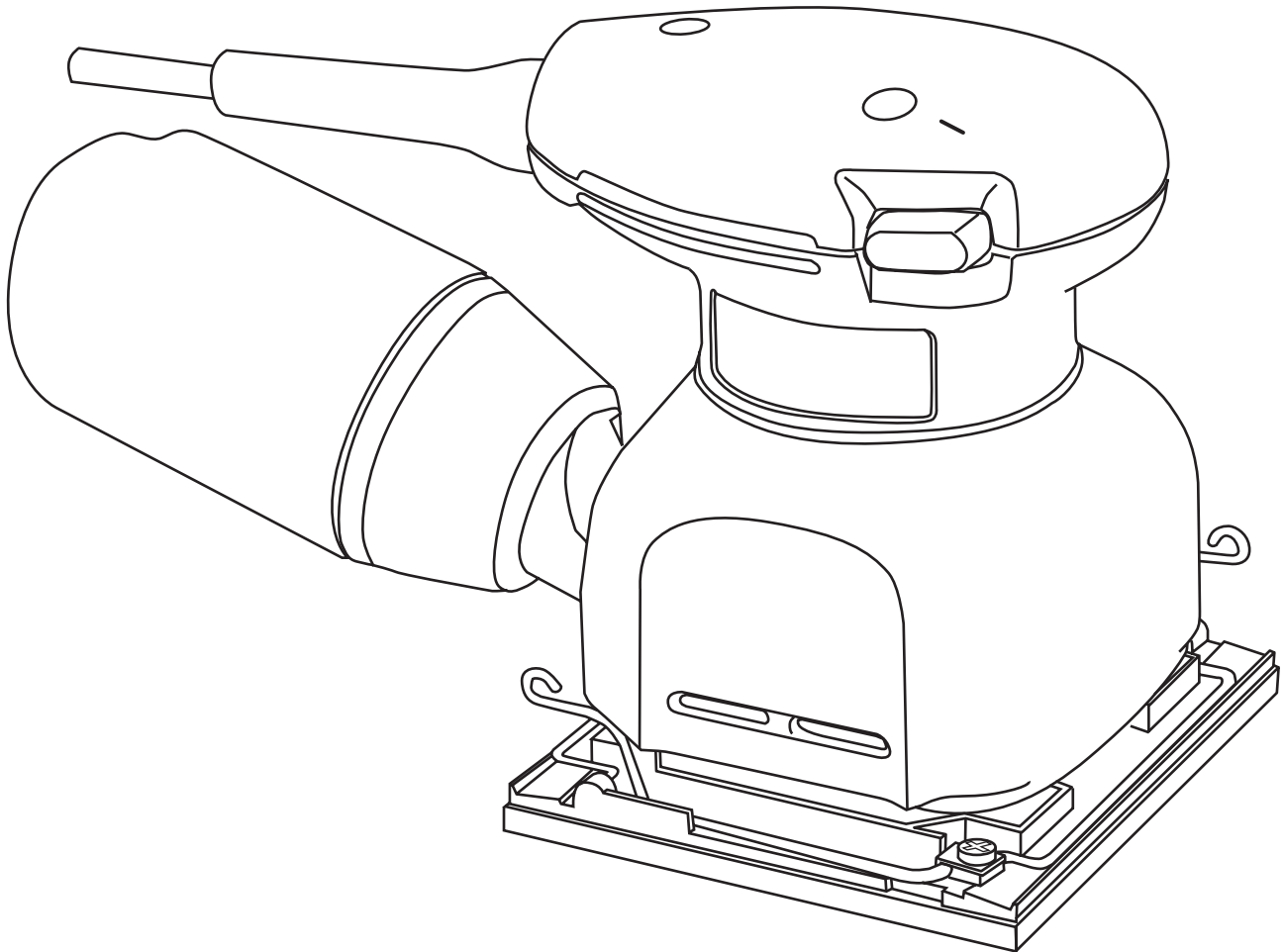




# OPERATOR'S MANUAL

## 1/4 SHEET SANDER – S650D

### DOUBLE INSULATED



Your new Sander has been engineered and manufactured to Ryobi's high standard for dependability, ease of operation, and operator safety. When properly cared for, the sheet sander will give you years of rugged, trouble-free performance.



**WARNING:** To reduce the risk of injury, the user must read and understand the operator's manual.

Thank you for buying a Ryobi product.

**SAVE THIS MANUAL FOR FUTURE REFERENCE**

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## INTRODUCTION

### DOUBLE INSULATION

Your Ryobi power tool is double insulated. Double insulation is a concept in safety, in electric power tools, which eliminates the need for the usual three-wire grounded power cord. All exposed metal parts are isolated from internal metal motor components with protecting insulation. Double insulated tools do not need to be grounded.

#### **WARNING:**

The double insulated system is intended to protect the user from shock resulting from a break in the tool's internal wiring. Observe all normal safety precautions related to avoiding electrical shock.

### IMPORTANT

Servicing of a tool with double insulation requires extreme care and knowledge of the system and should be performed only by a qualified service technician. For service we suggest you return the tool to your nearest **RYOBI AUTHORIZED SERVICE CENTER** for repair. When servicing use only identical Ryobi replacement parts.

#### **WARNING:**

Do not attempt to operate this tool until you have read thoroughly and understand completely all instructions, safety rules, etc. contained in this manual. Failure to comply can result in accidents involving fire, electric shock, or serious personal injury. Save operator's manual and review frequently for continuing safe operation, and instructing others who may use this tool.

#### **WARNING:**



The operation of any sander can result in foreign objects being thrown into your eyes, which can result in severe eye damage. Before beginning power tool operation, always wear safety goggles or safety glasses with side shields and a full face shield when needed. We recommend Wide Vision Safety Mask for use over eyeglasses or standard safety glasses with side shields. Always wear eye protection which is marked to comply with ANSI Z87.1.



**Look for this symbol to point out important safety precautions. It means attention!!! Your safety is involved.**

# GENERAL SAFETY RULES

## **WARNING:**

**Read and understand all instructions.** Failure to follow all instructions listed below, may result in electric shock, fire and/or serious personal injury.

## SAVE THESE INSTRUCTIONS

### Work Area

- **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
- **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
- **Keep bystanders, children, and visitors away while operating a power tool.** Distractions can cause you to lose control.

### Electrical Safety

- **Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.** Double insulation  eliminates the need for the three wire grounded power cord and grounded power supply system.
- **Avoid body contact with grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is grounded.
- **Don't expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
- **Do not abuse the cord. Never use the cord to carry the tools or pull the plug from an outlet. Keep cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.** Damaged cords increase the risk of electric shock.
- **When operating a power tool outside, use an outdoor extension cord marked "W-A" or "W".** These cords are rated for outdoor use and reduce the risk of electric shock.

### Personal Safety

- **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
- **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.

- **Avoid accidental starting. Be sure switch is off before plugging in.** Carrying tools with your finger on the switch or plugging in tools that have the switch on invites accidents.
- **Remove adjusting keys or wrenches before turning the tool on.** A wrench or a key that is left attached to a rotating part of the tool may result in personal injury.
- **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the tool in unexpected situations.
- **Use safety equipment. Always wear eye protection.** Dust mask, nonskid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

### Tool Use and Care

- **Use clamps or other practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.
- **Do not force tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
- **Do not use tool if switch does not turn it on or off.** Any tool that cannot be controlled with the switch is dangerous and must be repaired.
- **Disconnect the plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce risk of starting the tool accidentally.
- **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
- **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools with sharp cutting edges are less likely to bind and are easier to control.
- **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool's operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
- **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool, may become hazardous when used on another tool.

### Service

- **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.
- **When servicing a tool, use only identical replacement parts. Follow instructions in the Maintenance section of this manual.** Use of unauthorized parts or failure to follow Maintenance Instructions may create a risk of electric shock or injury.

# GENERAL SAFETY RULES

■ **Keep the tool and its handle dry, clean, and free from oil and grease.** Always use a clean cloth when clean-

ing. Never use brake fluids, gasoline, petroleum-based products, or any strong solvents to clean your tool.

# SPECIFIC SAFETY RULES

## Additional Rules for Safe Operation

■ **Know your power tool.** Read operator's manual carefully. Learn its applications and limitations as well as the specific potential hazards related to this tool. Following this rule will reduce the risk of electric shock, fire, or serious injury.

■ **Always wear safety glasses with side shields.** Everyday eyeglasses have only impact resistant lenses; they are **NOT** safety glasses.

■ **Protect your lungs.** Wear a face or dust mask if the operation is dusty.

■ **Protect your hearing.** Wear hearing protection during extended periods of operation.

■ **Inspect tool cords periodically** and if damaged, have repaired at your nearest authorized service center. Stay constantly aware of cord location.

■ **Check damaged parts.** Before further use of the tool, it should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A part that is damaged should be properly repaired or replaced by an authorized service center. Following this rule will reduce the risk of electric shock, fire, or serious injury.

■ **Do not abuse cord. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil and sharp edges.** Following this rule will reduce the risk of electric shock or fire.

■ **Make sure your extension cord is in good condition.**

When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. A wire gage size (A.W.G.) of at least **16** is recommended for an extension cord 100 feet or less in length. A cord exceeding 100 feet is not recommended. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.

■ **Drugs, Alcohol, Medication.** Do not operate tool while under the influence of drugs, alcohol, or any medication. Following this rule will reduce the risk of electric shock, fire, or serious injury.

## **WARNING:**

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:




- lead from lead-based paints,
- crystalline silica from bricks and cement and other masonry products, and
- arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

# SAVE THESE INSTRUCTIONS

# SYMBOLS

**Important:** Some of the following symbols may be used on your tool. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the tool better and safer.

SYMBOL	NAME	DESIGNATION/EXPLANATION
V	Volts	Voltage
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
min	Minutes	Time
~	Alternating Current	Type or a characteristic of current
≡	Direct Current	Type or a characteristic of current
$n_0$	No Load Speed	Rotational speed, at no load
.../min	Revolutions or Reciprocation Per Minute	Revolutions, strokes, surface speed, orbits etc. per minute
	Safety Alert Symbol	Indicates danger, warning or caution. It means attention!!! Your safety is involved.
	Eye Protection	Always wear safety goggles or safety glasses with side shields when operating this product.
	Wet Conditions Alert	Do not expose to rain or use in damp locations.

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols, and the explanations with them, deserve your careful attention and understanding. The safety warnings do not by themselves eliminate any danger. The instructions or warnings they give are not substitutes for proper accident prevention measures.

Symbol	Meaning
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**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING:** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION:** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices that may cause property damage.

<b>NOTE:</b>	Advises you of information or instructions vital to the operation or maintenance of the equipment.
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## SAVE THESE INSTRUCTIONS

# FEATURES

Your sander is suitable for sanding with coarse, medium, and fine grit sandpaper. It will produce a fine scratch free finish when used to sand with the grain on wood surfaces. It has been designed so that flush corner sanding on three sides of the sander is possible.

Your sander has a comfortable palm grip handle that provides maximum one-hand comfort, and reduces operator fatigue during continuous sanding operations.

Your sander has quick action paper clamps. This makes changing or replacing sandpaper fast and easy.

Your sander also has a built in dust collection that collects dust through punched holes in the sandpaper and cushion.

See Figure 1.

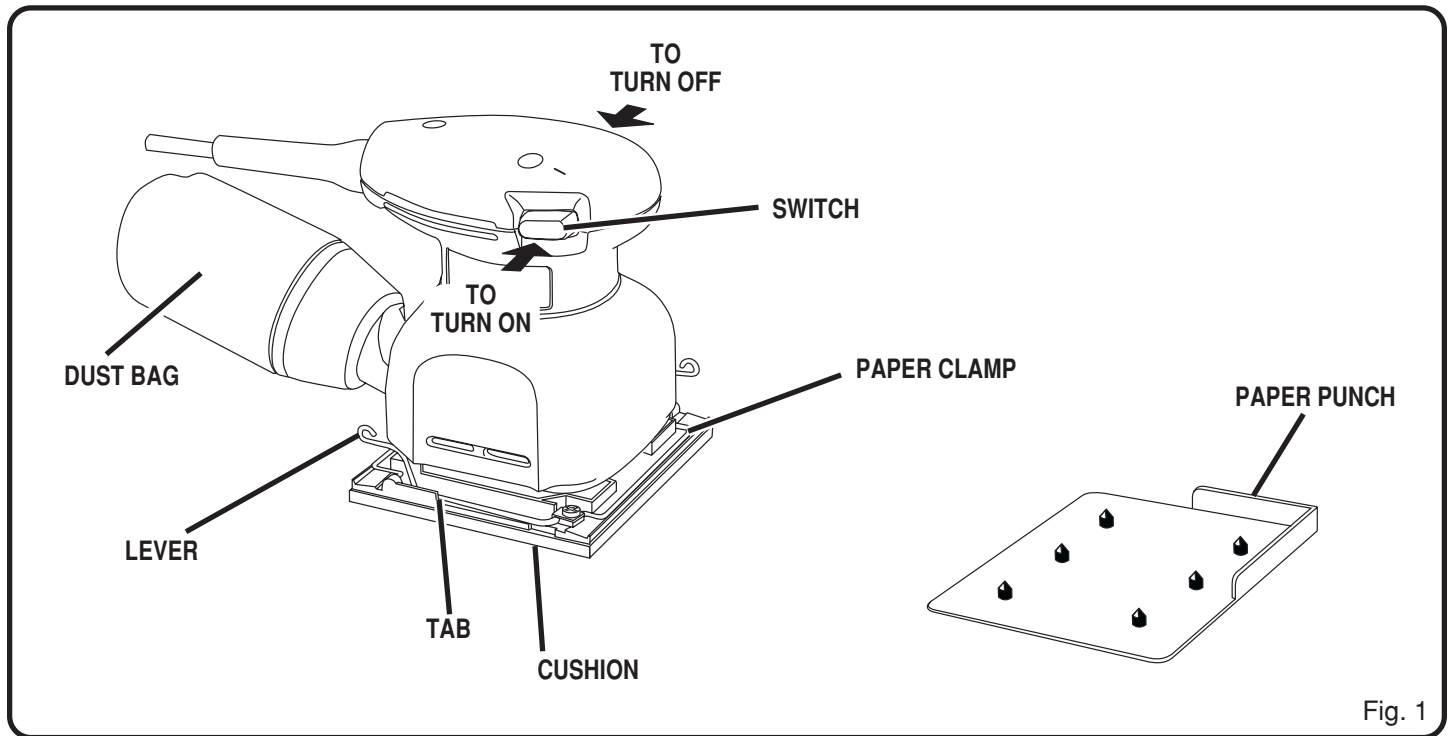
**Before attempting to use your sander, familiarize yourself with all operating features and safety requirements.**

## SWITCH

This tool is equipped with a simple switch control. To turn the sander "ON", slide the switch to the left (I) as shown in Figure 1. Slide the switch to the right (O) to turn the sander "OFF".

## ELECTRICAL CONNECTION

Your sander has a precision built electric motor. It should be connected to a **power supply that is 120 volts, 60 Hz, AC only (normal household current)**. Do not operate this tool on direct current (DC). A substantial voltage drop will cause a loss of power, and the motor will overheat. If your tool does not operate when plugged into an outlet, double-check the power supply.



**WARNING:** Do not allow familiarity with your sander to make you careless. Remember, a careless fraction of a second is sufficient to inflict severe injury.

# SPECIFICATIONS

Size of Paper .....	1/4 sheet
Motion .....	Orbital Action
Orbit Diameter .....	1/16 in. (1.6 mm)
No Load Speed .....	14,000 OPM
Input .....	2.0 Amperes
Rating .....	120 Volts, 60 Hz, AC

# UNPACKING

## INSTRUCTIONS

**Your sander has been shipped completely assembled.**

- Carefully remove the tool and accessories from the box. Make sure that all items listed in the packing list are included.
- Inspect the tool carefully to make sure no breakage or damage occurred during shipping.
- Do not discard the packing material until you have carefully inspected and satisfactorily operated the tool.
- If any parts are damaged or missing, please call 1-800-525-2579 for assistance.

## PACKING LIST

1/4 Sheet Orbital Sander  
Sandpaper (3 sheets)  
Dust Bag Assembly  
Operator's Manual

### **WARNING:**

If any parts are missing, do not operate your sander until the missing parts are replaced. Failure to do so could result in possible serious personal injury.

# APPLICATIONS

## APPLICATIONS

**(Use only for the purposes listed below)**

1. Sanding on wood surfaces.
2. Removing rust from and sanding steel surfaces.
3. Sanding plastics.



# OPERATION

## ⚠ WARNING:

Your sander should never be connected to power supply when you are assembling parts, making adjustments, assembling or replacing sandpaper, cleaning, or when not in use. Disconnecting sander will prevent accidental starting that could cause serious personal injury.

## INSTALLING NON-ADHESIVE SANDPAPER

See Figure 2.

Inspect sandpaper before installing. **DO NOT use if broken or defective.**

1. Unplug your sander.

## ⚠ WARNING:

Failure to unplug your sander could result in accidental starting causing possible serious injury.

2. If replacing sandpaper, remove old sandpaper. To remove paper, release paper clamp by lifting up on lever, and disengaging it from the tab, and allowing the lever to lower.
3. Insert end of new 1/4 sheet sandpaper approximately 1/2 in. (13 mm) under the paper clamp. **Note:** 1/2 in. (13 mm) clamping of sandpaper is necessary for multi-sheet stacking of paper.
4. Lift up on lever and lock into place. Apply downward pressure to conform sandpaper to platen.
5. Wrap sandpaper around cushion. Lift lever on opposite end of sander and insert loose end of sandpaper under paper clamp. Fit sandpaper tight against cushion.
6. Lift up on lever and lock into place.
7. Multiple sheets of sandpaper can be installed at one time for convenience.

## INSTALLING ADHESIVE SANDPAPER

See Figure 2.

Inspect sandpaper before installing. **DO NOT use broken or defective sandpaper.**

1. Unplug your sander.

## ⚠ WARNING:

Failure to unplug your sander could result in accidental starting causing possible serious personal injury.

2. If replacing sandpaper, remove old sandpaper by peeling it off cushion. If removing regular sandpaper, release paper clamp by lifting up on lever and disengaging it from the tab on the platen.
3. Remove non-adhesive sandpaper, then lift up on paper clamp lever and lock it into place.
4. Carefully peel adhesive backing from new 1/4 sheet sandpaper.
5. Position sandpaper, making sure front edge of sandpaper is aligned with front edge of the cushion, then carefully press sticky side of sandpaper on cushion. **Note:** Sandpaper must be aligned with the front edge of the cushion for proper functioning of the flush sanding feature. See Figure 2.

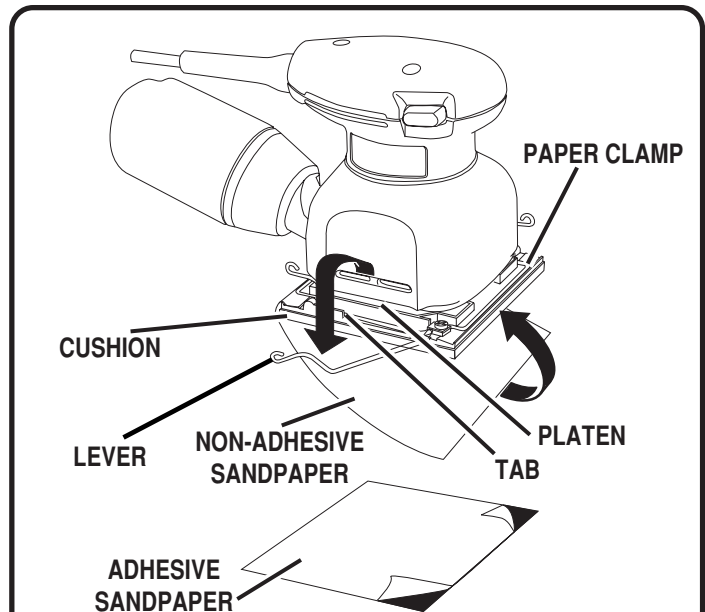


Fig. 2

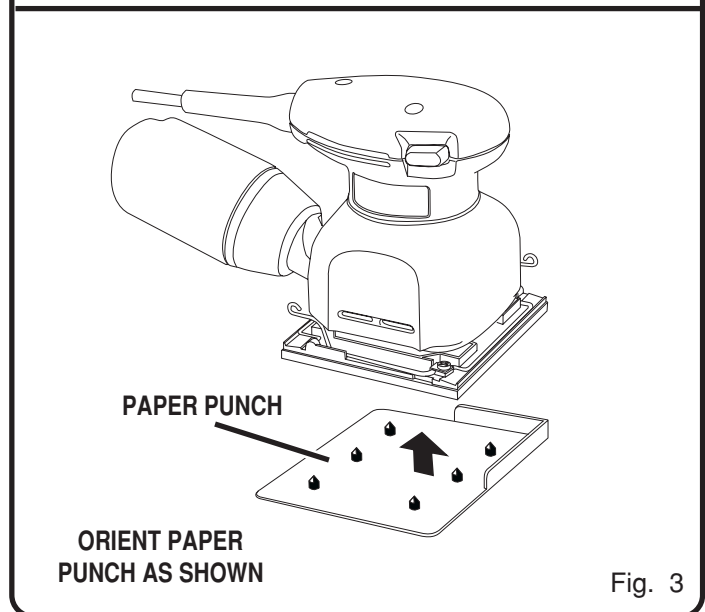


Fig. 3

**Note:** The cushion on your sander is approximately 1/4 in. (6.4 mm) smaller than precut adhesive backed sanding sheets. If desired you may want to trim off the overhang of sandpaper on the back side of cushion. The cushion has been made smaller so that multiple sheets of non-adhesive sandpaper can be installed.

## PAPER PUNCH

See Figure 3.

A paper punch template has been supplied with your sander for aligning and punching holes in sandpaper. The punched holes must align with the holes in the sander cushion.

1. Install sandpaper on your sander.
2. Align sander cushion over the paper punch. See Figure 3.
3. Push down on sander.



# OPERATION

## ⚠ WARNING:

Always wear safety goggles or safety glasses with side shields when operating your sander. Failure to do so could result in foreign objects being thrown into your eyes resulting in possible serious injury. If the sanding operation is dusty, also wear a face or dust mask.

## SANDPAPER SELECTION

Selecting the correct size grit and type sandpaper is an extremely important step in achieving a high quality sanded finish. Aluminum oxide, silicon carbide, and other synthetic abrasives are best for power sanding. Natural abrasives, such as flint and garnet are too soft for economical use in power sanding.

In general, coarse grit will remove the most material and finer grit will produce the best finish in all sanding operations. The condition of the surface to be sanded will determine which grit will do the job. If the surface is rough, start with a coarse grit and sand until the surface is uniform. Medium grit may then be used to remove scratches left by the coarser grit and finer grit used for finishing of the surface. Always continue sanding with each grit until surface is uniform.

**Note: DO NOT** use sander without sandpaper. Doing so will damage the cushion.

## PREPARING FOR OPERATION

## ⚠ CAUTION:

Be careful not to let your hand completely cover air vents.

## SANDING

Clamp or otherwise secure the work to prevent it from moving under your sander.

## ⚠ WARNING:

Unsecured work could be thrown towards the operator causing injury.

Hold your sander in front and away from you, keeping it clear of the workpiece. Start your sander by pressing the switch button to "ON" position and letting the motor build to its maximum speed. Gradually lower your sander on the work with a slight forward movement. *See Figure 4.* Move it slowly using forward and backward strokes.

**DO NOT FORCE.** The weight of the unit supplies adequate pressure, so let the sandpaper and sander do the work. Applying additional pressure only slows the motor, rapidly wears sandpaper and greatly reduces sander speed. Excessive pressure will overload the motor causing possible damage from motor overheating and can result in inferior work. Any finish or resin on wood may soften from the frictional heat. Do not allow sanding on one spot too long as the sander's rapid action may remove too much material, making the surface uneven.

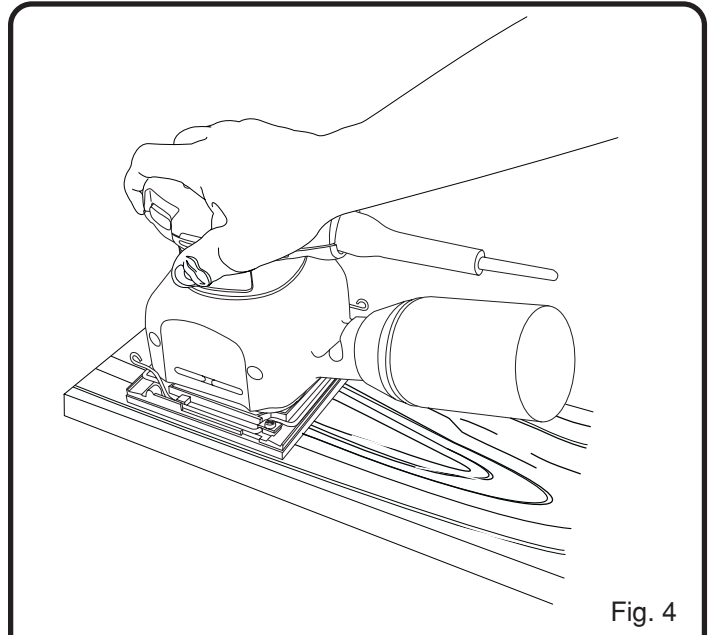


Fig. 4

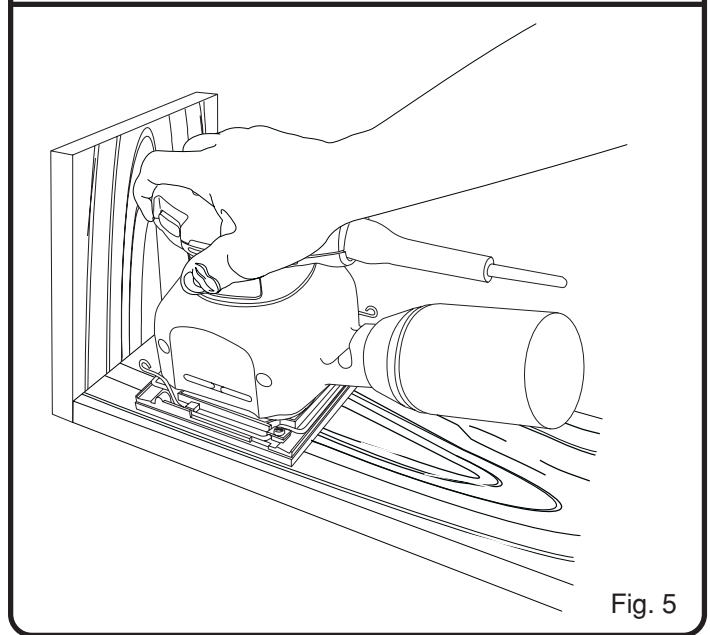


Fig. 5

Flush sanding can be performed with your sander. *See Figure 5.* The front edge of your sander allows flush sanding in corners. Always remove sander from workpiece before turning your sander off.

## ⚠ WARNING:

Do not wear loose clothing or jewelry when operating sander. They could get caught in moving parts causing serious injury. Keep head away from sander and sanding area. Hair could be drawn into sander causing serious injury.

# OPERATION

## ORBITAL MOTION

Orbital motion is ideal for fast cutting action when removing old finishes, smoothing rough wood, cutting stock down to required dimensions, or for finishing surfaces to be painted. As shown in figure 6, the sandpaper moves in tiny circles at a very high speed, allowing the sander to move easily.

### **⚠ WARNING:**

Collected sanding dust from sanding surface coatings such as polyurethanes, linseed oil, etc. can self-ignite in your sander dust bag or elsewhere and cause fire. To reduce the risk of fire always empty your dust bag frequently while sanding and never store or leave a sander without totally emptying its dust bag. Also follow the recommendations of the coatings manufacturers.

## USING THE DUST BAG ASSEMBLY

The dust bag assembly provides a dust collection system for the sander. Sanding dust is drawn up through the holes of the sanding disc and collected in the dust bag during sanding.

### TO ATTACH THE DUST BAG ASSEMBLY

See Figure 7.

Follow these directions to attach the dust bag assembly.

- Unplug the sander.

### **⚠ WARNING:**

Failure to unplug the tool could result in accidental starting causing possible serious injury.

- Slide the dust bag assembly onto the blower exhaust on the sander using a slight twisting motion.

### TO EMPTY THE DUST BAG ASSEMBLY

See Figure 7 and 8.

For more efficient operation, empty the dust bag when it is no more than half full. This will permit the air to flow through the bag better. Always empty and clean the dust bag thoroughly upon completion of a sanding operation and before placing the sander in storage.

### TO EMPTY DUST BAG

- Unplug your sander.

### **⚠ WARNING:**

Failure to unplug your sander could result in accidental starting causing possible serious personal injury.

- Remove the dust bag assembly from the sander.
- Remove the dust bag from the frame.
- Shake out the dust.
- Replace the dust bag on the frame.
- Replace the dust bag assembly on the sander.

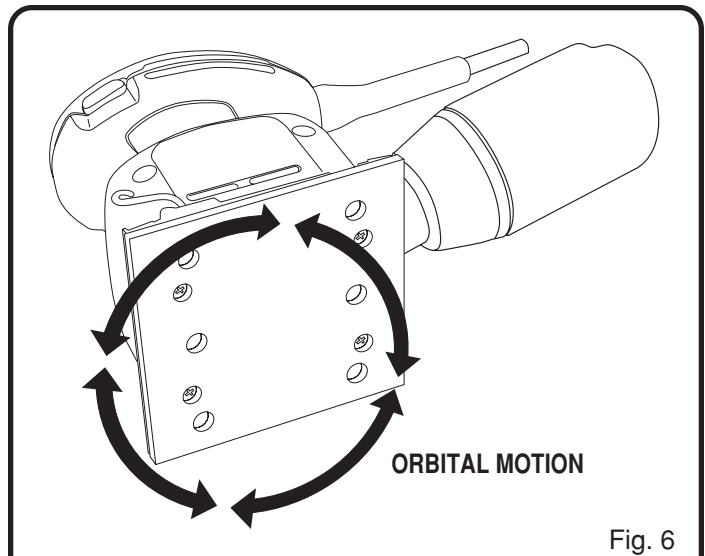


Fig. 6

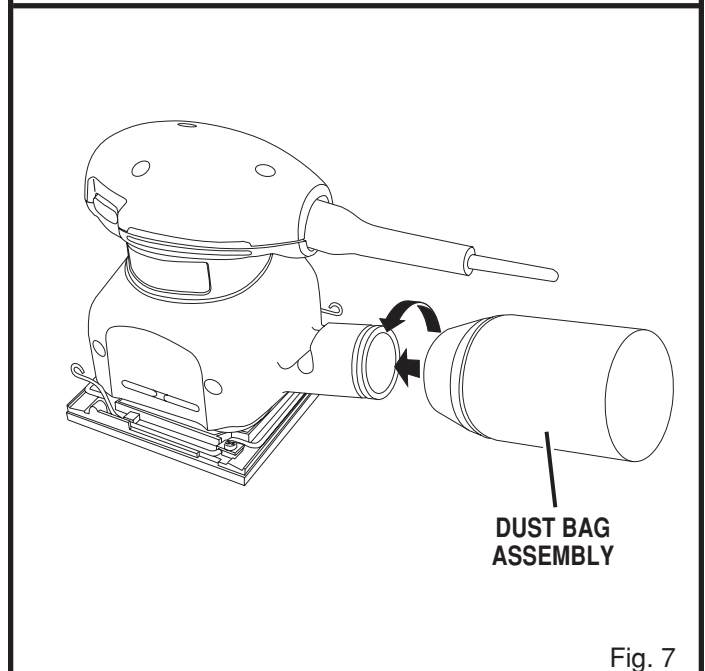


Fig. 7

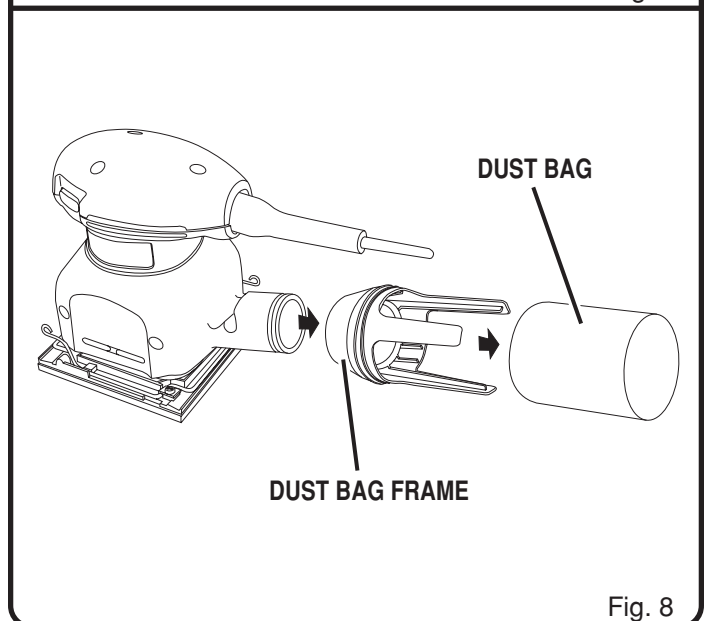


Fig. 8

# MAINTENANCE

## **WARNING:**

When servicing use only identical Ryobi replacement parts. Use of any other parts may create a hazard or cause product damage.

## **GENERAL**

Avoid using solvents when cleaning plastic parts. Most plastics are susceptible to various types of commercial solvents and may be damaged by their use. Use clean cloths to remove dirt, carbon dust, etc.

## **WARNING:**

Do not at any time let brake fluids, gasoline, petroleum-based products, penetrating oils, etc., come in contact with plastic parts. They contain chemicals that can damage, weaken, or destroy plastic.

When electric tools are used on fiberglass boats, sports cars, wallboard, spackling compounds, or plaster, it has been found that they are subject to accelerated wear and possible premature failure, as the fiberglass chips and grindings are highly abrasive to bearings, brushes, commutator, etc. Consequently it is not recommended that this tool be used for extended work on any fiberglass material, wallboard, spackling compounds, or plaster. During any use on these materials, it is extremely important that the tool is cleaned frequently by blowing with an air jet.

## **LUBRICATION**

All of the bearings in this tool are lubricated with a sufficient amount of high grade lubricant for the life of the unit under normal operating conditions. Therefore, no further lubrication is required.

## **WARNING:**

Always wear safety goggles, or safety glasses with side shields during power tool operation or when blowing dust. If operation is dusty, also wear a dust mask.

## **EXTENSION CORDS**

The use of any extension cord will cause some loss of power. To keep the loss to a minimum and to prevent tool overheating, use an extension cord that is heavy enough to carry the current the tool will draw. Follow the recommended cord sizes on the chart provided to determine the minimum wire size required in an extension cord.

<b>Extension Cord Length</b>	<b>Wire Gauge Size (A.W.G.)</b>
<b>0-100 Feet</b>	<b>16</b>

When working with your tool outdoors, use an extension cord suitable for outdoor use and so marked. Outdoor use extension cords are marked with the letters "WA" on the cord's jacket.

## **CAUTION:**

Keep extension cords away from the sanding area and position the cord so that it will not get caught on lumber, tools, etc., when sanding.

## **WARNING:**

Check extension cords before each use. If damaged, replace immediately. Never use tool with a damaged cord since touching the damaged area could cause electrical shock resulting in serious injury.



# OPERATOR'S MANUAL

## 1/4 SHEET SANDER – S650D

### DOUBLE INSULATED

- **SERVICE**

Now that you have purchased your tool, should a need ever exist for repair parts or service, simply contact your nearest Ryobi Authorized Service Center. Be sure to provide all pertinent facts when you call or visit. Please call 1-800-525-2579 for your nearest Ryobi Authorized Service Center. You can also check our web site at [www.ryobitools.com](http://www.ryobitools.com) for a complete list of Authorized Service Centers.

- **MODEL NO. AND SERIAL NO.**

The model number of this tool will be found on a plate attached to the motor housing. Please record the model number and serial number in the space provided below.

- MODEL NUMBER S650D
- SERIAL NUMBER \_\_\_\_\_

### RYOBI TECHNOLOGIES, INC.

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